

Rutgers Turfgrass Breeding for Drought Resistance

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The Rutgers New Jersey Agricultural Experiment Station (NJAES) has been at the forefront of turfgrass research, selecting superior cultivars and propagating these selections for generations. Turfgrass breeding for traits such as drought resistance and salt tolerance has continued under the direction of Dr. William Meyer since 1996 and Dr. Stacy Bonos since 2001. The 206-acre [Plant Science Research and Extension Farm](#), often referred to as the Adelphia Farm, has been a Rutgers NJAES facility since 1962. During the 1980s, the turfgrass breeding program started to expand under the direction of Dr. C. Reed Funk and the Adelphia Farm became the ideal site to develop more drought and heat-resistant cultivars of cool-season grasses. The Center for Turfgrass Science currently breeds drought-tolerant turfgrass to reduce water use and salt-tolerant turfgrass so that greywater and recycled water can be used for turfgrass irrigation.



*Rutgers tall fescue turfgrass selections, breeding for drought resistance.
Photo credit: William Meyer, Rutgers NJAES.*

In order to develop turfgrass varieties with drought resistance, individual plants from the most promising turf plots are selected and cloned for planting under a rain-out shelter. The rain-out shelter is fully automated and allows the Rutgers turfgrass breeding program to subject plants to severe drought conditions without interruption from rain events. Generally, tall fescue clones are planted in early fall and allowed to establish through spring of the following year. Following a drought period, lasting approximately 75 – 90 days, individual plants that retain green color and are actively growing are removed and divided up into replicated clones. The following spring, these clones are then assembled into isolated crossing-blocks according to their phenotype. Seed is harvested from the crossing-blocks in early summer and then planted in progeny turf trials. In some cases, this results in the release of new cultivars. Altogether, repeated selection of tall fescue germplasm has resulted in the development of over 100 new cultivars within the past decade. These cultivars have topped the National Turfgrass Evaluation Program's trials throughout the country and have improved stress tolerance. In an environment where water poses a critical limiting factor for households and businesses, drought-resistant turfgrass varieties are critical for not only visual appeal, but also livelihood for business owners, comfort for homeowners, and habitat creation.



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